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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/729,562	12/04/2000	David R. Smith	500582.20016	4111

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REED SMITH, LLP
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EXAMINER	
TAYLOR, BARRY W	
ART UNIT	PAPER NUMBER
2643	

DATE MAILED: 04/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 09/729,562	Applicant(s) SMITH ET AL.	
	Examiner Barry W Taylor	Art Unit 2643	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *06 August 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *47-66 and 68* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *47-66 and 68* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Objections

1. Claim 68 is objected to because of the following informalities: Claim 67 has been cancelled and claim 68 depends on claim 67. Appropriate correction is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

2. Claims 47-66 and 68 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang (U.S. 5,881,130) in view of Liu et al (U.S. 6,266,395 hereinafter Liu) further in view of Galli et al (6,538,451 hereinafter Galli).

Regarding claims 47 and 61. Zhang teaches a method for determining the suitability of a wire communication line for xDSL service via single-ended analysis, comprising:

obtaining a return waveform by using TDR at a single end of the wire communication line (see abstract wherein a stimulus waveform is applied to line, see single-ended measurement unit 116 figure 1 used, see single-ended measurement unit detailed in figure 2, see figure 3B wherein waveforms are generated and samples taken from the returned waveforms and stored for later processing---steps 316-322);

next the time domain samples are processed via FFT (i.e. step 326) producing complex values enabling for power spectra to be computed. The power spectra equations shown in equations 6 and 7 (see equations 6 and 7 located in columns 5-6 and col. 8 lines 60-63) are then used to determine the transfer function shown in equation 3 (see equation 3 column 5 and col. 8 lines 64-67) which reads on determining the transfer function based on return waveform.

analyzing the transfer function (see figure 4 wherein the transfer function is shown allowing a person to analyze how many load coils are present).

Zhang does not show analyzing the transfer function so as to qualify the wire communication line for xDSL use. However, Zhang is very clear in that the transfer information of the line may be used for other diagnostic functions (col. 9 lines 29-32 and col. 10 lines 32-36).

Liu teaches a method and apparatus for qualification of subscriber loops for xDSL services. The method involves first screening a subscriber loop database record (col. 6 line 18- 67) for disqualifying devices or services on the subscriber loop. If none are found, a set of predetermined electrical characteristics (col. 3 lines 1-45, col. 5 line 6 – col. 6 line 17) of the subscriber loop are derived from information in the database (col. 8 line 6 – col. 10 line 49), **<u>or</u>** directly measured using testing equipment (col. 3 lines 1-45, col. 6 line 59 – col. 7 line 65). The advantage is the rapid and inexpensive qualification of subscriber loops, which reduces response time to potential customer queries and facilitates deployment of xDSL services (Title, abstract, columns 1-3). Liu discloses prior art methods have attempted to use measurement alone to generate rate predictions (col. 2 lines 6-7). Consequently, those prior art methods have failed because they do not correct for the physical properties of the subscriber loop, or equipment on the subscriber loop. Liu even discloses that Zhang fails to show (see col. 1 lines 40-50) using single ended device to determine bandwidth capacity (i.e. analyzing the transfer function to qualify the wire communication line). <u>Furthermore, Lin teaches measuring wideband noise (see column 3 wherein wide band Noise on subscriber loop is measured, col. 7 lines 24-33 reveals wide band noise measured on the subscriber loop at subscriber end. Lin discloses that noise is a value derived from the wide band noise of the subscriber loop (col. 10 lines 41-58).</u>

Therefore, it would have been obvious to any one of ordinary skill in the art at the time the invention was made to modify the invention as taught by Zhang to use physical characteristics of line as taught by Liu for the benefit of using the physical characteristic

of line to provide a consistently accurate assessment of bandwidth available for xDSL service.

However, Applicant's contend that Zhang and Liu both fail to teach using single-ended TDR (see Applicant's general remark on page 9, paper number 19, Amendment "D", first full paragraph and page 11, last full paragraph.

Galli also teaches a single ended measuring method and system for determining subscriber loop make up (abstract) wherein TDR used to determine transfer function (col. 11 line 8 – col. 19 line 36). Galli also discloses using modeling techniques (abstract). Galli discloses determining the make-up of subscriber loops via single ended measurements (see figure 2B, col. 4 line 30 – col. 5 line 23). Galli discloses sending at least one pulse on the loop, receiving echoes generated when pulse encounters a discontinuity, and processing the received echoes (see compute transfer function, col. 5 line 12) to determine type and location of discontinuity. Galli indeed uses TDR (see at least columns 6 and 7), as well as, signal loss (see col. 8 lines 5-65) of the echo (i.e. returned/reflected signal). Galli even accounts for spurious echoes resulting from two consecutive gauge changes (col. 9 lines 1-39), as well as, spurious echoes resulting from bridge taps (col. 9 line 40 – col. 10 line 64). Galli discloses determining noise for Signal-to-Noise Ratio (col. lines 3-34), using acquired and measured data (col. 12 line 35 – col. 13 line 32) and transfer function (col. 13 line 66 – col. 14 line 53, col. 15 line4 – col. 16 line 60). Galli also uses complex values (col. 17 line 58). Furthermore, Galli teaches broadband test head (figure 2b, col. 4 line 36, col. 5 lines 34-36) used to

identify "noise" (col. 4 line 65 – col. 5 line23) further facilitating service provisioning process. Galli even shows equation for insertion loss (col. 8 lines 5-64).

Therefore, it would have been obvious for any one of ordinary skill in the art at the time of invention to modify the invention as taught by Zhang in view of Liu to use transfer function as taught by Galli for the benefit qualifying line for DSL by detecting gauge changes.

Regarding claims 48 and 62. Zhang does not explicitly show deriving a plant map (i.e. physical properties) from the return wave.

Liu teaches a method and apparatus for qualification of subscriber loops for xDSL services. The method involves first screening a subscriber loop database record (col. 6 line 18- 67) for disqualifying devices or services on the subscriber loop. If none are found, a set of predetermined electrical characteristics (col. 3 lines 1-45, col. 5 line 6 – col. 6 line 17) of the subscriber loop are derived from information in the database (col. 8 line 6 – col. 10 line 49), or directly measured using testing equipment (col. 3 lines 1-45, col. 6 line 59 – col. 7 line 65). The advantage is the rapid and inexpensive qualification of subscriber loops, which reduces response time to potential customer queries and facilitates deployment of xDSL services (Title, abstract, columns 1-3). Liu discloses prior art methods have attempted to use measurement alone to generate rate predictions (col. 2 lines 6-7). Consequently, those prior art methods have failed because they do not correct for the physical properties of the subscriber loop, or equipment on the subscriber loop. Liu even discloses that Zhang fails to show (see

col. 1 lines 40-50) using single ended device to determine bandwidth capacity (i.e. analyzing the transfer function to qualify the wire communication line).

Therefore, it would have been obvious to any one of ordinary skill in the art at the time the invention was made to modify the invention as taught by Zhang to use physical characteristics of line as taught by Liu for the benefit of using the physical characteristic of line to provide a consistently accurate assessment of bandwidth available for xDSL service.

Regarding claims 49 and 63. Zhang teaches does not explicitly show using plant models. However, Zhang uses complex values of line to calculate transfer function.

Liu teaches a method and apparatus for qualification of subscriber loops for xDSL services. The method involves first screening a subscriber loop database record (col. 6 line 18- 67) for disqualifying devices or services on the subscriber loop. If none are found, a set of predetermined electrical characteristics (col. 3 lines 1-45, col. 5 line 6 – col. 6 line 17) of the subscriber loop are derived from information in the database (col. 8 line 6 – col. 10 line 49), **or** directly measured using testing equipment (col. 3 lines 1-45, col. 6 line 59 – col. 7 line 65). The advantage is the rapid and inexpensive qualification of subscriber loops, which reduces response time to potential customer queries and facilitates deployment of xDSL services (Title, abstract, columns 1-3). Liu discloses prior art methods have attempted to use measurement alone to generate rate predictions (col. 2 lines 6-7). Consequently, those prior art methods have failed because they do not correct for the physical_properties of the subscriber loop, or

equipment on the subscriber loop. Liu even discloses that Zhang fails to show (see col. 1 lines 40-50) using single ended device to determine bandwidth capacity (i.e. analyzing the transfer function to qualify the wire communication line).

Therefore, it would have been obvious to any one of ordinary skill in the art at the time the invention was made to modify the invention as taught by Zhang to use physical characteristics of line as taught by Liu for the benefit of using the physical characteristic of line to provide a consistently accurate assessment of bandwidth available for xDSL service.

Regarding claim 50. Zhang does not show analyzing the transfer function so as to qualify the wire communication line for xDSL use. However, Zhang is very clear in that the transfer information of the line may be used for other diagnostic functions (col. 9 lines 29-32 and col. 10 lines 32-36).

Liu teaches a method and apparatus for qualification of subscriber loops for xDSL services. The method involves first screening a subscriber loop database record (col. 6 line 18- 67) for disqualifying devices or services on the subscriber loop. If none are found, a set of predetermined electrical characteristics (col. 3 lines 1-45, col. 5 line 6 – col. 6 line 17) of the subscriber loop are derived from information in the database (col. 8 line 6 – col. 10 line 49), <u>or</u> directly measured using testing equipment (col. 3 lines 1-45, col. 6 line 59 – col. 7 line 65). The advantage is the rapid and inexpensive qualification of subscriber loops, which reduces response time to potential customer queries and facilitates deployment of xDSL services (Title, abstract, columns 1-3). Liu

discloses prior art methods have attempted to use measurement alone to generate rate predictions (col. 2 lines 6-7). Consequently, those prior art methods have failed because they do not correct for the physical properties of the subscriber loop, or equipment on the subscriber loop. Liu even discloses that Zhang fails to show (see col. 1 lines 40-50) using single ended device to determine bandwidth capacity (i.e. analyzing the transfer function to qualify the wire communication line). Liu also obtains noise single (col. 7 lines 25-67, col. 8 lines 6-32, and col. 8 line 33 – col. 11 line 29) to be used for qualifying line for xDSL.

Therefore, it would have been obvious to any one of ordinary skill in the art at the time the invention was made to modify the invention as taught by Zhang to use SNR as taught by Liu for the benefit of using SNR of line to provide a consistently accurate assessment of bandwidth available for xDSL service.

Method claim 51 is a combination of claims 47 and 48; therefore rejections to claims 47 and 48 listed above apply.

Regarding claims 52 and 68. Zhang does not show plant map includes wire gauge and length. Liu improves on Zhang and uses gauge and length (col. 3 lines 1-25).

Regarding claim 53. Zhang does not show wideband noise. Liu improves on Zhang and uses wideband noise single (col. 3 lines 5-6, col. 7 lines 26-28, col. 8 lines 6-32, col. 10 lines 27-67, col. 11 lines 7-29).

Regarding claim 54. Zhang teaches using complex values (see column 8 wherein step 326 produces complex values enabling for power spectra to be computed, then power spectra equations shown in equations 6 and 7 are then used to determine the transfer function shown in equation 3 (see equation 3 column 5 and col. 8 lines 64-67). Liu also uses complex values and cable lengths (columns 9-10).

Regarding claims 55 and 59. Zhang does not explicitly show performing circuit modeling.

Liu teaches a method and apparatus for qualification of subscriber loops for xDSL services. The method involves first screening a subscriber loop database record (col. 6 line 18- 67) for disqualifying devices or services on the subscriber loop. If none are found, a set of predetermined electrical characteristics (col. 3 lines 1-45, col. 5 line 6 – col. 6 line 17) of the subscriber loop are derived from information in the database (col. 8 line 6 – col. 10 line 49), <u>or</u> directly measured using testing equipment (col. 3 lines 1-45, col. 6 line 59 – col. 7 line 65). The advantage is the rapid and inexpensive qualification of subscriber loops, which reduces response time to potential customer queries and facilitates deployment of xDSL services (Title, abstract, columns 1-3). Liu discloses prior art methods have attempted to use measurement alone to generate rate predictions (col. 2 lines 6-7). Consequently, those prior art methods have failed because they do not correct for the physical properties of the subscriber loop, or equipment on the subscriber loop. Liu even discloses that Zhang fails to show (see

col. 1 lines 40-50) using single ended device to determine bandwidth capacity (i.e. analyzing the transfer function to qualify the wire communication line).

Therefore, it would have been obvious to any one of ordinary skill in the art at the time the invention was made to modify the invention as taught by Zhang to use physical characteristics of line as taught by Liu for the benefit of using the physical characteristic of line to provide a consistently accurate assessment of bandwidth available for xDSL service.

Regarding claims 56 and 60. Zhang teaches does not explicitly show using plant models. However, Zhang uses complex values of line to calculate transfer function.

Liu teaches a method and apparatus for qualification of subscriber loops for xDSL services. The method involves first screening a subscriber loop database record (col. 6 line 18- 67) for disqualifying devices or services on the subscriber loop. If none are found, a set of predetermined electrical characteristics (col. 3 lines 1-45, col. 5 line 6 – col. 6 line 17) of the subscriber loop are derived from information in the database (col. 8 line 6 – col. 10 line 49), **<u>or</u>** directly measured using testing equipment (col. 3 lines 1-45, col. 6 line 59 – col. 7 line 65). The advantage is the rapid and inexpensive qualification of subscriber loops, which reduces response time to potential customer queries and facilitates deployment of xDSL services (Title, abstract, columns 1-3). Liu discloses prior art methods have attempted to use measurement alone to generate rate predictions (col. 2 lines 6-7). Consequently, those prior art methods have failed because they do not correct for the physical_properties of the subscriber loop, or

equipment on the subscriber loop. Liu even discloses that Zhang fails to show (see col. 1 lines 40-50) using single ended device to determine bandwidth capacity (i.e. analyzing the transfer function to qualify the wire communication line).

Therefore, it would have been obvious to any one of ordinary skill in the art at the time the invention was made to modify the invention as taught by Zhang to use physical characteristics of line as taught by Liu for the benefit of using the physical characteristic of line to provide a consistently accurate assessment of bandwidth available for xDSL service.

Regarding claims 57 and 65. Zhang does not show analyzing the transfer function so as to qualify the wire communication line for xDSL use. However, Zhang is very clear in that the transfer information of the line may be used for other diagnostic functions (col. 9 lines 29-32 and col. 10 lines 32-36).

Liu teaches a method and apparatus for qualification of subscriber loops for xDSL services. The method involves first screening a subscriber loop database record (col. 6 line 18- 67) for disqualifying devices or services on the subscriber loop. If none are found, a set of predetermined electrical characteristics (col. 3 lines 1-45, col. 5 line 6 – col. 6 line 17) of the subscriber loop are derived from information in the database (col. 8 line 6 – col. 10 line 49), <u>or</u> directly measured using testing equipment (col. 3 lines 1-45, col. 6 line 59 – col. 7 line 65). The advantage is the rapid and inexpensive qualification of subscriber loops, which reduces response time to potential customer queries and facilitates deployment of xDSL services (Title, abstract, columns 1-3). Liu

discloses prior art methods have attempted to use measurement alone_to generate rate predictions (col. 2 lines 6-7). Consequently, those prior art methods have failed because they do not correct for the physical properties of the subscriber loop, or equipment on the subscriber loop. Liu even discloses that Zhang fails to show (see col. 1 lines 40-50) using single ended device to determine bandwidth capacity (i.e. analyzing the transfer function to qualify the wire communication line). Liu also obtains noise single (col. 7 lines 25-67, col. 8 lines 6-32, col. 8 line 33 – col. 11 line 29) to be used for qualifying line for xDSL.

Therefore, it would have been obvious to any one of ordinary skill in the art at the time the invention was made to modify the invention as taught by Zhang to use SNR as taught by Liu for the benefit of using SNR of line to provide a consistently accurate assessment of bandwidth available for xDSL service.

Regarding claims 58 and 66. Zhang does not show determine bit rate and confidence factor.

Liu further shows calculating bit rate for all subchannels (see 514 figure 11) and the accuracy depends on measurements and calculations (col. 7 lines 31-41, col. 10 lines 28-49, col. 11 lines 17-18). Therefore, it would have been obvious to any one of ordinary skill in the art at the time the invention was made to modify the invention as taught by Zhang to use SNR as taught by Liu for the benefit of using SNR of line to provide a consistently accurate assessment of bandwidth available for xDSL service.

Method claim 64 is a combination of claims 51 and 57; therefore rejections to claims 51 and 57 listed above apply.

Response to Arguments

3. Applicant's arguments filed 8/6/04 have been fully considered but they are not persuasive.

a) Regarding Applicant's remark on page 7, last paragraph wherein Applicant's contend that "measuring wideband noise at the customer end" is not disclosed by the Galli reference.

The Examiner notes: <u>Lin teaches measuring wideband noise (see column 3 wherein wide band Noise on subscriber loop is measured, col. 7 lines 24-33 reveals wide band noise measured on the subscriber loop at subscriber end. Lin discloses that noise is a value derived from the wide band noise of the subscriber loop (col. 10 lines 41-58).</u>

<u>Galli also teaches broadband test head (figure 2b, col. 4 line 36, col. 5 lines 34-36) used to identify "noise" (col. 4 line 65 – col. 5 line23) further facilitating service provisioning process. Galli even shows equation for insertion loss (col. 8 lines 5-64).</u>

b) Regarding Applicant's remark on page 8, last paragraph wherein Applicant's contend that Galli fails to teach using known wire plant maps and the library function taught by Liu only refers to physical characteristic of the line resistance, inductance, conductance and capacitance values.

The Examiner notes that Lin also discloses additional characteristics can include wide band noise (see col. 3 lines 1-16, col. 7 lines 24-33). In fact, Lin even compares measure noise to wide band noise value (see at least col. 10 line 41 – col. 11 line 6).

c) Regarding Applicant's remark on page 9 wherein Applicant's contend that Galli does not teach TDR and discourages using TDR.

If this were true, why would Galli allow for the broadband test head to be augmented or used to replace prior art single ended testers (col. 4 lines 33-38)?

Conclusion

4. THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Barry W. Taylor, telephone number (571) 272-7509, who is available Monday-Friday, 8am to 5pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Curtis Kuntz, can be reached at (571) 272-7499. The facsimile phone number for this group is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group 2600 receptionist whose telephone number is (571) 272-2600, the 2600 Customer Service telephone number is (571) 272-2600.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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